

WHAT IS CLAIMED IS:

1. A radio frequency power amplifier comprising:  
a bipolar transistor for emitter ground amplification  
having a base connected to an input terminal and a base bias  
5 power supply and having a collector connected to an output  
terminal.
2. The radio frequency power amplifier according to claim  
1,  
10 wherein a resistor and a coil are inserted parallel  
between the base and the base bias power supply.
3. The radio frequency power amplifier according to claim  
1,  
15 wherein a bias resistor is inserted between the base  
and the base bias power supply, and there is provided a  
function of detecting an average voltage at a base-side node  
of the bias resistor and changing output voltage from the  
base bias power supply in accordance with a detected value.  
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4. The radio frequency power amplifier according to claim  
3,  
wherein the base bias power supply comprises a first  
bipolar transistor, first and second resistors, and a first  
25 capacitor, and

wherein the first bipolar transistor is configured to ground an emitter, ground a base via the first capacitor, connect a collector to a constant voltage supply via the first resistor, and connect the base to the collector via  
5 the second resistor.

5. The radio frequency power amplifier according to claim 4,

wherein the first bipolar transistor is configured to  
10 connect the base to a base of the amplifying bipolar transistor via the first capacitor and a resistor constituting a low-pass filter and connect the collector to the base of the amplifying bipolar transistor via the bias resistor.

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6. The radio frequency power amplifier according to claim 5,

wherein there are excluded the resistor constituting the low-pass filter and the first capacitor, and the base  
20 of the first bipolar transistor is connected to the base of the amplifying bipolar transistor via a coil.

7. A radio frequency power amplifier comprising:

a bipolar transistor for emitter ground amplification  
25 having a base connected to an input terminal and to a base

bias power supply via a bias resistor and having a collector connected to an output terminal; and

a bipolar transistor for average output current detection in which a base is connected not only to a  
5 high-frequency input terminal, but also to the base bias power supply via a resistor equivalent to the bias resistor, and a collector is connected to the base bias power supply,

wherein there is provided a function of using the bipolar transistor to detect an average output current and  
10 changing output voltage from the base bias power supply in accordance with a detected value.

8. The radio frequency power amplifier according to claim 7,

15 wherein the base bias power supply includes a first bipolar transistor, first and second resistors, and a first capacitor, and

wherein the first bipolar transistor is configured to ground an emitter, ground a base via the first capacitor,  
20 connect a collector to a constant voltage supply via the first resistor, and connect the base to the collector via the second resistor.

9. The radio frequency power amplifier according to claim  
25 8,

wherein a collector of the first bipolar transistor is connected to the base of the amplifying bipolar transistor via a bias resistor, and

wherein the detection bipolar transistor is  
5 configured to connect the collector to the base of the first bipolar transistor and connect the base not only to the collector of the first bipolar transistor via a resistor equivalent to the bias resistor, but also to the high-frequency input terminal.

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10. The radio frequency power amplifier according to claim 7,

wherein the base bias power supply comprises a first bipolar transistor, first and second resistors, and a first  
15 capacitor, and

wherein the first bipolar transistor is configured to connect a collector to a constant voltage supply, ground an emitter via the first resistor, connect a base to a constant voltage supply via the second resistor, and ground the same  
20 via the first capacitor.

11. The radio frequency power amplifier according to claim 1,

wherein the bipolar transistor is an SiGe  
25 hetero-junction bipolar transistor in which the base

comprises SiGe mix crystal, and the emitter and the collector comprise Si, and

wherein the bipolar transistor is configured to ground an emitter, connect a base to an input terminal and  
5 a base bias power supply, and connect a collector to an output terminal; a bias resistor is inserted between the base and the base bias power supply; and there is provided a function of detecting an average value of base current or collector current and correspondingly changing an output  
10 voltage from the base bias power supply.

12. A communication system comprising:

a digital signal processor;  
a baseband section;  
15 an intermediate frequency (IF) section;  
a synthesizer;  
a down-conversion mixer;  
an up-conversion mixer;  
a driver;  
20 a power amplifier;  
a low noise amplifier;  
a duplexor; and  
an antenna,  
wherein the power amplifier comprises:

a bipolar transistor for emitter ground amplification having a base connected to an input terminal and a base bias power supply and having a collector connected to an output terminal.

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13. The communication system according to claim 12,  
wherein a resistor and a coil are inserted parallel between the base and the base bias power supply.

10 14. The communication system according to claim 12,  
wherein a bias resistor is inserted between the base and the base bias power supply, and there is provided a function of detecting an average voltage at a base-side node of the bias resistor and changing output voltage from the  
15 base bias power supply in accordance with a detected value.

15. The communication system according to claim 14,  
wherein the base bias power supply comprises a first bipolar transistor, first and second resistors, and a first  
20 capacitor, and

wherein the first bipolar transistor is configured to ground an emitter, ground a base via the first capacitor, connect a collector to a constant voltage supply via the first resistor, and connect the base to the collector via  
25 the second resistor.

16. The communication system according to claim 15,

wherein the first bipolar transistor is configured to connect the base to a base of the amplifying bipolar transistor via the first capacitor and a resistor constituting a low-pass filter and connect the collector to the base of the amplifying bipolar transistor via the bias resistor.

10 17. The communication system according to claim 16,

wherein there are excluded the resistor constituting the low-pass filter and the first capacitor, and the base of the first bipolar transistor is connected to the base of the amplifying bipolar transistor via a coil.